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(54) **VERTICALLY ORIENTED BAND FOR STOMACH**
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patent is extended or adjusted under 35
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This patent is subject to a terminal dis-
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CPC **A61F 5/0086** (2013.01); **A61B 17/122**
(2013.01)

(58) **Field of Classification Search**
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(56) **References Cited**
U.S. PATENT DOCUMENTS
350,850 A 10/1886 Tatum
422,906 A 3/1890 Booth
(Continued)

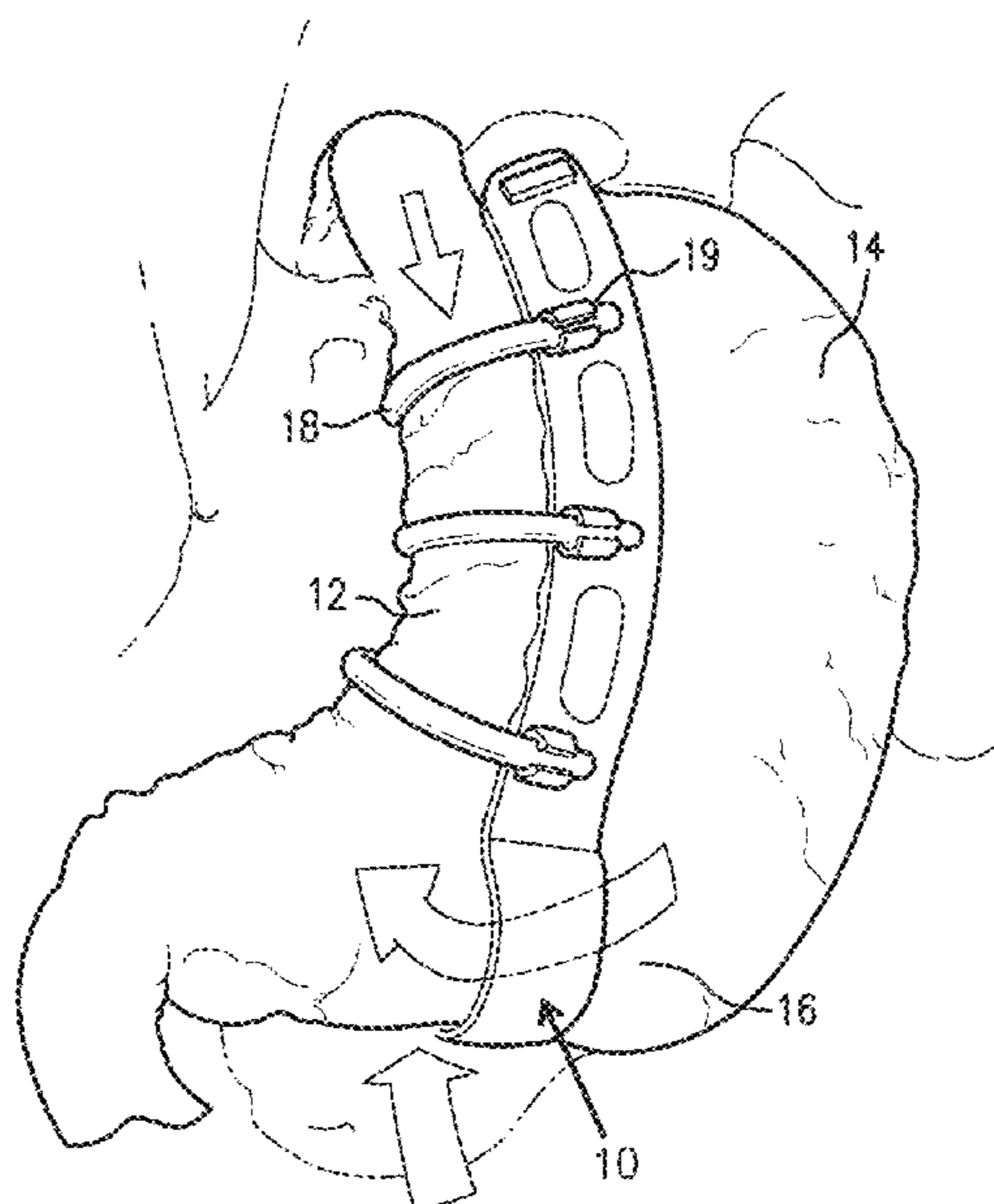
FOREIGN PATENT DOCUMENTS
AU 201399422 2/2017
AU 2018247195 A1 11/2018
(Continued)

OTHER PUBLICATIONS
U.S. Appl. No. 15/677,227, Final Office Action dated Jun. 8, 2021,
12 pgs.
(Continued)

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(57) **ABSTRACT**
An adjustable band or clamp or non-adjustable clamp is
placed about the greater curvature of the stomach in a
vertical orientation. The band or clamp completely compart-
mentalizes the stomach between a small vertical pouch and
the fundus and body of the stomach. The fundus and body
of the stomach are excluded from nutrients and are separated
from a long narrow channel where the food travels. A small
passage at the level of the antrum allows gastric juices to
empty from the fundus and body of the stomach. The clamp
may be applied during open surgery in laproscopic surgery
or using a single port technique, or through any natural
orifice in NOTES (Natural Orifice Transluminal Endoscopic
surgery) or using a hybrid surgical technique.

19 Claims, 5 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

2006/0235468 A1 10/2006 Huitema et al.
 2006/0241653 A1 10/2006 Jones et al.
 2006/0252983 A1 11/2006 Lembo et al.
 2006/0264981 A1 11/2006 Viola
 2006/0264982 A1 11/2006 Viola et al.
 2006/0264987 A1 11/2006 Sgro
 2007/0016231 A1 1/2007 Jambor et al.
 2007/0021761 A1 1/2007 Phillips
 2007/0032807 A1 2/2007 Ortiz et al.
 2007/0088190 A1 4/2007 Appel
 2007/0088191 A1 4/2007 Appel
 2007/0149989 A1 6/2007 Santilli et al.
 2007/0167962 A1 7/2007 Gannoe et al.
 2007/0185373 A1 8/2007 Tsonon
 2007/0213747 A1 9/2007 Monassevitch et al.
 2007/0233005 A1 10/2007 McMichael et al.
 2007/0250090 A1 10/2007 Makower et al.
 2007/0265644 A1 11/2007 Ichihara et al.
 2007/0282356 A1 12/2007 Sonnenschein et al.
 2008/0033457 A1 2/2008 Francischelli et al.
 2008/0039879 A1 2/2008 Chin et al.
 2008/0082114 A1 4/2008 McKenna et al.
 2008/0092910 A1 4/2008 Brooks
 2008/0177292 A1 7/2008 Jacobs et al.
 2008/0208324 A1 8/2008 Glithero et al.
 2008/0269788 A1 10/2008 Phillips
 2008/0275480 A1 11/2008 Jacobs et al.
 2008/0287975 A1 11/2008 Weaner et al.
 2008/0287976 A1 11/2008 Weaner et al.
 2008/0312670 A1 12/2008 Sampica et al.
 2008/0319435 A1 12/2008 Rioux et al.
 2009/0012542 A1 1/2009 N'Diaye et al.
 2009/0088783 A1 4/2009 Kennedy et al.
 2009/0137870 A1 5/2009 Bakos et al.
 2009/0138009 A1 5/2009 Viswanathan et al.
 2009/0198266 A1 8/2009 Cesare
 2009/0240105 A1 9/2009 Smit et al.
 2009/0281377 A1 11/2009 Newell et al.
 2009/0292163 A1 11/2009 Kassab et al.
 2010/0010511 A1 1/2010 Harris et al.
 2010/0030017 A1 2/2010 Baker et al.
 2010/0082050 A1 4/2010 Kassab et al.
 2010/0096570 A1 4/2010 Kashmirian et al.
 2010/0168768 A1 7/2010 Sonnenschein et al.
 2010/0174295 A1 7/2010 Kassab et al.
 2010/0249510 A1 9/2010 Yamada
 2010/0268161 A1 10/2010 Traversaz
 2010/0274268 A1 10/2010 Singh et al.
 2010/0312050 A1 12/2010 Forsell
 2011/0046641 A1 2/2011 Kassab et al.
 2011/0092993 A1 4/2011 Jacobs
 2011/0092998 A1 4/2011 Hirszowicz et al.
 2011/0093007 A1 4/2011 Abbott et al.
 2011/0098732 A1 4/2011 Jacobs
 2011/0112434 A1 5/2011 Ghabrial et al.
 2011/0172767 A1 7/2011 Rathi et al.
 2011/0190791 A1 8/2011 Jacobs et al.
 2011/0245593 A1 10/2011 Kassab et al.
 2011/0270016 A1 11/2011 Snow et al.
 2012/0095484 A1 4/2012 Dominguez
 2012/0123463 A1 5/2012 Jacobs
 2012/0215061 A1 8/2012 Fridez et al.
 2013/0261382 A1 10/2013 Acosta
 2014/0012293 A1 1/2014 Bertolero et al.
 2014/0046345 A1 2/2014 Armenteros et al.
 2014/0074131 A1 3/2014 Armenteros et al.
 2014/0200598 A1 7/2014 Kassab et al.
 2014/0350664 A1 11/2014 Tozzi et al.
 2015/0038794 A1 2/2015 Pattison et al.
 2015/0051624 A1 2/2015 Jacobs et al.
 2015/0150595 A1 6/2015 Pattison et al.
 2016/0058594 A1 3/2016 Armenteros et al.
 2017/0258619 A1 9/2017 Jacobs et al.
 2017/0360447 A1 12/2017 Armenteros et al.
 2018/0008447 A1 1/2018 Jacobs et al.

2019/0021892 A1 1/2019 French
 2019/0358068 A1 11/2019 Armenteros et al.
 2020/0054340 A1 2/2020 Armenteros et al.
 2021/0177633 A1 6/2021 French
 2021/0369281 A1 12/2021 Armenteros et al.

FOREIGN PATENT DOCUMENTS

AU 2017200911 12/2018
 AU 2015306617 2/2020
 CA 2880155 2/2014
 CN 1652725 A 8/2005
 CN 1923148 A 8/2006
 CN 1895186 A 1/2007
 CN 101011272 A 8/2007
 CN 202027648 U 4/2011
 CN 102415910 A 4/2012
 CN 105007838 10/2015
 CN 107072660 8/2017
 CN 109316221 A 2/2019
 CN 109805978 A 5/2019
 CO 30415 12/2016
 DE 19751733 12/1998
 DE 29822558 2/1999
 EP 0 201 344 11/1986
 EP 0 220 643 5/1987
 EP 1 397 998 3/2004
 EP 1 547 529 6/2005
 EP 1 600 108 11/2005
 EP 1 749 506 2/2007
 EP 1 806 101 7/2007
 EP 1 882 451 1/2008
 EP 2 528 512 B1 12/2012
 EP 3 185 784 7/2017
 EP 3 398 538 11/2018
 EP 2 882 354 B2 9/2020
 EP 3 777 719 A1 2/2021
 JP 9289989 11/1997
 JP 2002085414 3/2002
 JP 3425417 B2 7/2003
 JP 2007044517 2/2007
 JP 2007097664 4/2007
 JP 2007159794 6/2007
 MX 371177 1/2020
 NZ 704680 5/2017
 RU 2213529 C2 10/2003
 RU 2262896 C2 6/2005
 RU 2386455 4/2010
 RU 2626875 8/2017
 RU 2703508 A 10/2019
 RU 2019131501 A 11/2019
 SA 6733 B 12/2019
 TH 158414 12/2016
 TH 174586 3/2018
 WO WO-80/01752 A1 9/1980
 WO WO-1998/033437 8/1998
 WO WO-9833437 8/1998
 WO WO-1999/11179 3/1999
 WO WO-9911179 3/1999
 WO WO-2000/078234 12/2000
 WO WO-0078234 12/2000
 WO WO-2000076432 12/2000
 WO WO-2002/064041 8/2002
 WO WO-2004017839 3/2004
 WO WO-2005/046453 A2 5/2005
 WO WO-2006/033385 3/2006
 WO WO-2006/044640 4/2006
 WO WO-2007009099 A2 * 1/2007 A61B 17/083
 WO WO-2007013995 2/2007
 WO WO-2008081436 7/2008
 WO WO-2008091537 7/2008
 WO WO-2008101048 8/2008
 WO WO-2008/147582 A2 12/2008
 WO WO-2011/094700 8/2011
 WO WO-2014/026170 2/2014
 WO WO-2016/033221 3/2016

(56) **References Cited**

FOREIGN PATENT DOCUMENTS

WO WO-2018/009669 1/2018
 WO WO-2019/023279 A1 1/2019

OTHER PUBLICATIONS

U.S. Appl. No. 15/642,919, Non-Final Office Action dated Jun. 17, 2021, 18 pgs.

U.S. Appl. No. 16/533,309, Non-Final Office Action dated Jun. 16, 2021, 16 pgs.

U.S. Appl. No. 15/642,919, Non-Final Office Action dated Apr. 30, 2020, 30 pgs.

U.S. Appl. No. 15/677,227, Non-Final Office Action dated Nov. 27, 2019, 9 pgs.

International Pat. Appl. No. PCT/US2018/043562, International Preliminary Report on Patentability dated Jan. 28, 2020, 9 pgs.

U.S. Appl. No. 15/642,919, Final Office Action dated Jan. 29, 2020, 22 pgs.

U.S. Appl. No. 15/642,919, Final Office Action dated Oct. 28, 2020, 21 pgs.

U.S. Appl. No. 16/044,382, filed Jul. 24, 2018, Clamp Installation Tool.

U.S. Appl. No. 15/642,919, filed Jul. 6, 2017, dated Inflatable Bariatric Clamp.

U.S. Appl. No. 13/963,998, filed Aug. 9, 2013, Polymer Overmolded Bariatric Clamp and Method of Installing.

U.S. Appl. No. 16/664,447, Non-Final Office Action, dated Nov. 25, 2020, 13 pgs.

U.S. Appl. No. 16/044,382, Non-Final Office Action dated Aug. 20, 2020, 19 pgs.

U.S. Appl. No. 16/664,447, Notice of Allowance dated Apr. 13, 2021, 12 pgs.

“A Pathway to Endoscopic Bariatric Therapies” *Gastrointestinal Endoscopy Journal*, www.giejournal.org, vol. 74, No. 5 (2011), pp. 943-953.

An espace English abstract of DE-19751733 (Dec. 10, 1998).

An espace English abstract of JP-2007097664-A (Apr. 19, 2007).

An espace English abstract of JP-2007159794-A (Jun. 28, 2007).

An espace English abstract of JP-9289989-A (Nov. 11, 1997).

Certificate of Grant of copending Singapore Application No. SG11201500782R, dated Jun. 15, 2017.

Communication and Partial Supplementary European Search Report of EP Application No. EP15837010.6, dated May 11, 2018, 10 pgs.

Communication and Supplementary European Search Report of EP Application No. EP11737828, dated Sep. 23, 2014.

Copending International Patent Application No. PCT/US2013/54435 filed Aug. 9, 2013, entitled “Polymer Overmolded Bariatric Clamp and Method of Installing”; First Named Inventor: Armenteros, Jesus R.

Copending International Patent Application No. PCT/US2015/47005 filed Aug. 26, 2015; First Named Inventor: Moises Jacobs.

Copending International Patent Application No. PCT/US17/40908 filed Jul. 6, 2017; First Named Inventor: Jesus R. Armenteros.

Copending U.S. Appl. No. 13/963,998, filed Aug. 9, 2013; Inventors: Jesus R. Armenteros et al.

Copending U.S. Appl. No. 14/836,621, filed Aug. 26, 2015; First-Named Inventor: Jesus R. Armenteros.

Copending U.S. Appl. No. 15/642,919, filed Jul. 6, 2017; First-Named Inventor: Moises Jacobs.

Copending U.S. Appl. No. 15/677,227, filed Aug. 15, 2017; First-Named Inventor: Jesus R. Armenteros.

Copending U.S. Appl. No. 62/042,117 filed Aug. 26, 2014; first named inventor: Jesus R. Armenteros.

Copending U.S. Appl. No. 62/118,455, filed Feb. 19, 2015; first named inventor: Jesus R. Armenteros.

Copending U.S. Appl. No. 62/536,364, filed Jul. 24, 2017; first named inventor: C. Kenneth French.

Copending U.S. Appl. No. 62/359,529, filed Jul. 7, 2016; first named inventor: Jesus R. Armenteros.

Final Office Action for U.S. Appl. No. 13/963,998 dated Apr. 18, 2017 (16 pgs).

freedictionary.com definition of “stretchable”, accessed on Aug. 2, 2017, <http://www.thefreedictionary.com/stretchable>.

Geoffrey W.J. Vertical Ligated Gastroplasty by Clamp, Cut and Suture: A Series of 504 Cases Dating Back to 1977. *Obes Surg.* Nov. 1994;4(4):344-348, PMID: 10742799 [PubMed—as supplied by publisher], 5 pgs.

Helmut Kapczynski, *Surgical Instruments 101, An Introduction to Kmedic Certified Instruments*, Kmedic, Inc., 1997, Northvale, New Jersey (181 Pages).

International Preliminary Report on Patentability cited in PCT/US2008/000644, dated Nov. 17, 2009 (4 pgs).

International Preliminary Report on Patentability cited in PCT/US2011/023205, dated Jul. 31, 2012 (10 pgs).

International Preliminary Report on Patentability cited in PCT/US2013/054435, dated Jun. 9, 2015 (9 pgs).

International Preliminary Report on Patentability of PCT/US2015/047005, dated Mar. 9, 2017.

International Search Report and Written Opinion of PCT/US17/40908, dated Sep. 11, 2017.

International Search Report and Written Opinion of PCT/US18/43562, dated Nov. 21, 2018, 17 pgs.

International Search Report and Written Opinion of PCT/US2015/047005, dated Nov. 27, 2015.

International Search Report cited in PCT/US2013/54435, dated Jan. 16, 2014 (2 pgs).

International Search Report dated Nov. 27, 2015 in corresponding PCT Appln. PCT/US2015/047005, 13 pages.

Jacobs, Moises, et al., Presentation, “A Novel Procedure for Bariatric and Metabolic Surgery, a weight loss clamp” Apr. 2015 (20 pgs). Machine Translation of DE29822558 U1.

Office Action for U.S. Appl. No. 13/963,998 dated Nov. 15, 2016 (13 pgs).

Office Action for U.S. Appl. No. 11/797,537 dated Jul. 16, 2009 (10 pages).

Office Action for U.S. Appl. No. 11/797,537 dated Jan. 7, 2010 (9 pages).

Office Action Restriction Requirement for U.S. Appl. No. 13/963,998 dated Jun. 1, 2016 (8 pgs).

Patent Abstract of Japan of JP-2002085414-A (Mar. 26, 2002).

Patent Abstract of Japan of JP-2007044517-A (Feb. 22, 2007).

PCT International Patent Application No. PCT/US2017/040908, International Preliminary Report on Patentability and Notification dated Jan. 17, 2019, 9 pgs.

PCT International Search Report and Written Opinion cited in Patent Application No. PCT/US2011/023205, dated Apr. 5, 2011 (13 pgs).

PCT International Search Report cited in Patent Application No. PCT/US2008/000644, dated Jul. 7, 2008 (1 pg).

Publication of Co-Pending Singapore Patent Application No. 10201704073T, Jun. 29, 2017, 1 pg.

Search Report dated Apr. 19, 2018 in Singapore Pat. App. No. 11201701503Y, 3 pgs.

Search Report of copending Singapore Application No. SG11201500782R, dated Oct. 8, 2015.

Shalimov, et al., *Intestinal Track Surgery*, Kiev, “Dzorovya”, 1987, c. 558, 2 pgs.

Supplementary European Search Report in EP Application No. EP13828055.7, dated Aug. 31, 2016, 5 pgs.

U.S. Appl. No. 15/642,919, Non-Final Office Action dated Aug. 6, 2019, 22 pgs.

U.S. Appl. No. 13/963,998, Final Office Action dated Feb. 7, 2019, 36 pgs.

U.S. Appl. No. 13/963,998, Final Office Action dated Apr. 18, 2018 (29 pgs).

U.S. Appl. No. 13/963,998, Non-Final Office Action dated Aug. 8, 2018 (36 pgs).

U.S. Appl. No. 13/963,998, Non-Final Office Action dated Aug. 21, 2017 (23 pgs).

U.S. Appl. No. 13/963,998, Notice of Allowance, dated May 30, 2019, 11 pgs.

(56)

References Cited

OTHER PUBLICATIONS

U.S. Appl. No. 14/836,621, Advisory Action dated Apr. 10, 2019, 6 pgs.
U.S. Appl. No. 14/836,621, Final Office Action dated Jan. 31, 2019, 11 pgs.
U.S. Appl. No. 14/836,621, Notice of Allowance, dated Apr. 30, 2019, 13 pgs.
U.S. Appl. No. 15/677,227, Non-Final Office Action, dated Jun. 13, 2019, 10 pgs.
U.S. Appl. No. 14/836,621, Final Office Action dated Mar. 16, 2018 (17 pgs.).
U.S. Appl. No. 14/836,621, Non-Final Office Action dated Jul. 6, 2018 (13 pgs).
U.S. Appl. No. 14/836,621, Non-Final Office Action dated Aug. 22, 2017 (16 pgs).
Written Opinion cited in PCT/US2008/000644, dated Jul. 7, 2008 (3 pgs).
Written Opinion cited in PCT/US2013/54435 dated Jan. 16, 2014 (8 pgs).
U.S. Appl. No. 16/044,382, Notice of Allowance dated Sep. 10, 2020, 12 pgs.

U.S. Appl. No. 15/677,227, Advisory Action dated Aug. 20, 2021, 5 pgs.
U.S. Appl. No. 15/677,227, Non-Final Office Action dated Dec. 8, 2021, 11 pgs.
U.S. Appl. No. 15/642,919, filed Jul. 6, 2017, Inflatable Bariatric Clamp.
U.S. Appl. No. 15/677,227, filed Aug. 15, 2017, Surgical Clamp and Surgical Clamp Installation Tool.
U.S. Appl. No. 16/533,309, filed Aug. 6, 2019, Bariatric Clamp With Suture Portions, Magnetic Inserts and Curvature.
U.S. Appl. No. 16/664,447, filed Oct. 25, 2019, Polymer Overmolded Bariatric Clamp and Method of Installing.
U.S. Appl. No. 17/185,887, filed Feb. 25, 2011, Clamp Installation Tool.
U.S. Appl. No. 17/403,645, filed Aug. 16, 2021, Polymer Overmolded Bariatric Clamp and Method of Installing.
U.S. Appl. No. 16/533,309, Final Office Action dated Jan. 24, 2022, 16 pgs.
Final Office Action on U.S. Appl. No. 15/677,227 dated May 5, 2022.
Non-Final Office Action on U.S. Appl. No. 16/533,309 dated Jul. 8, 2022.

* cited by examiner

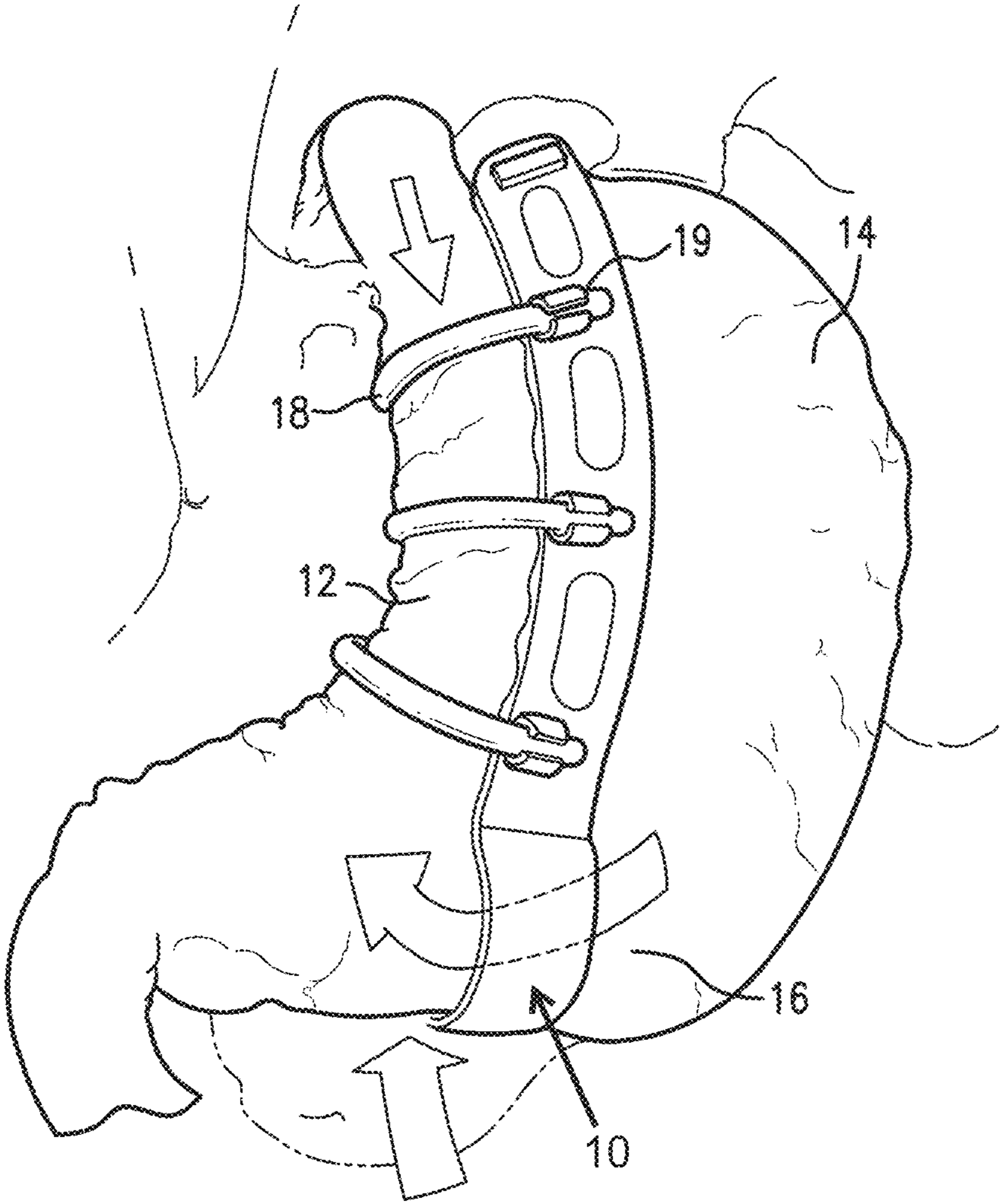


FIG. 1

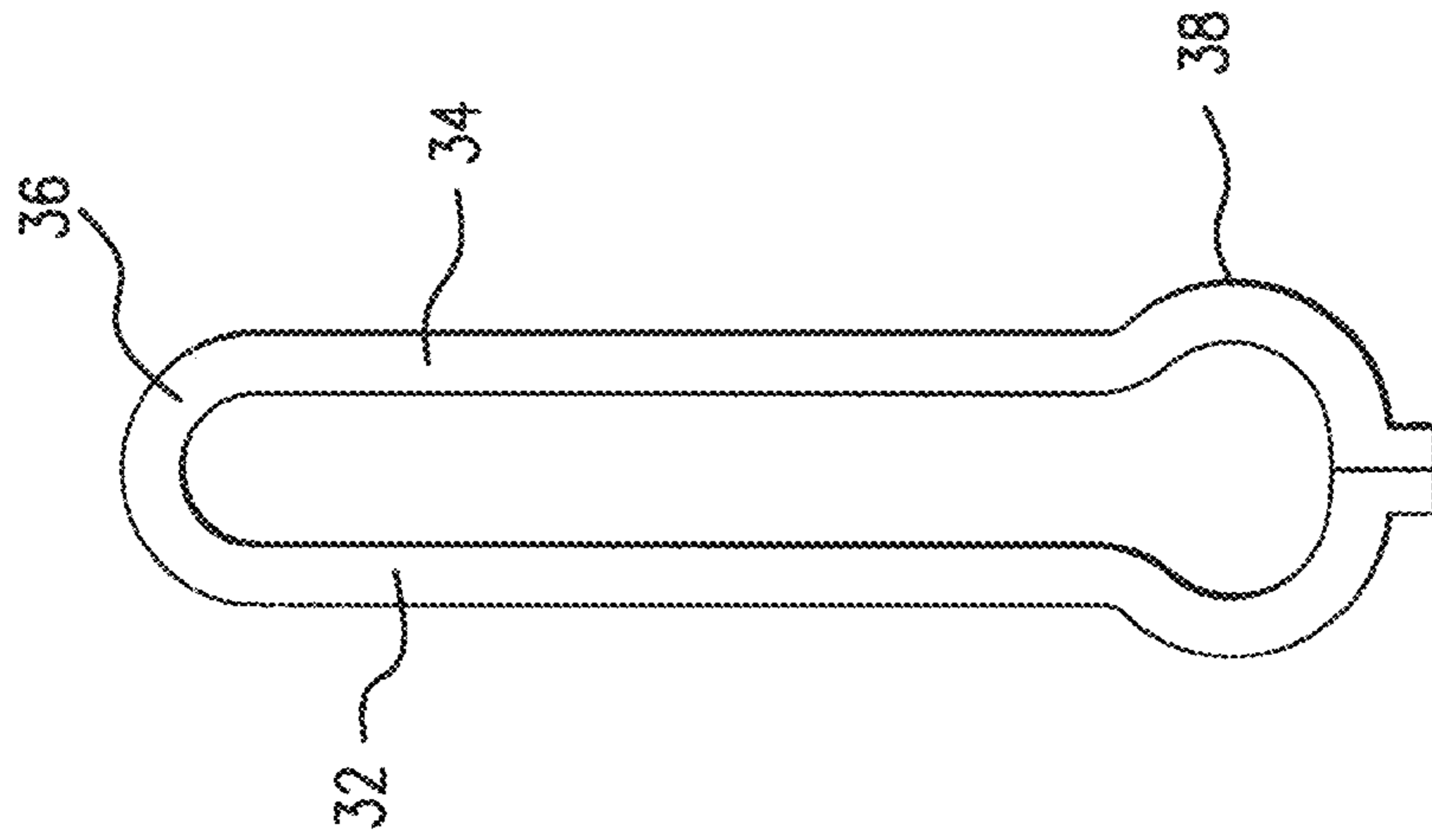


FIG. 3

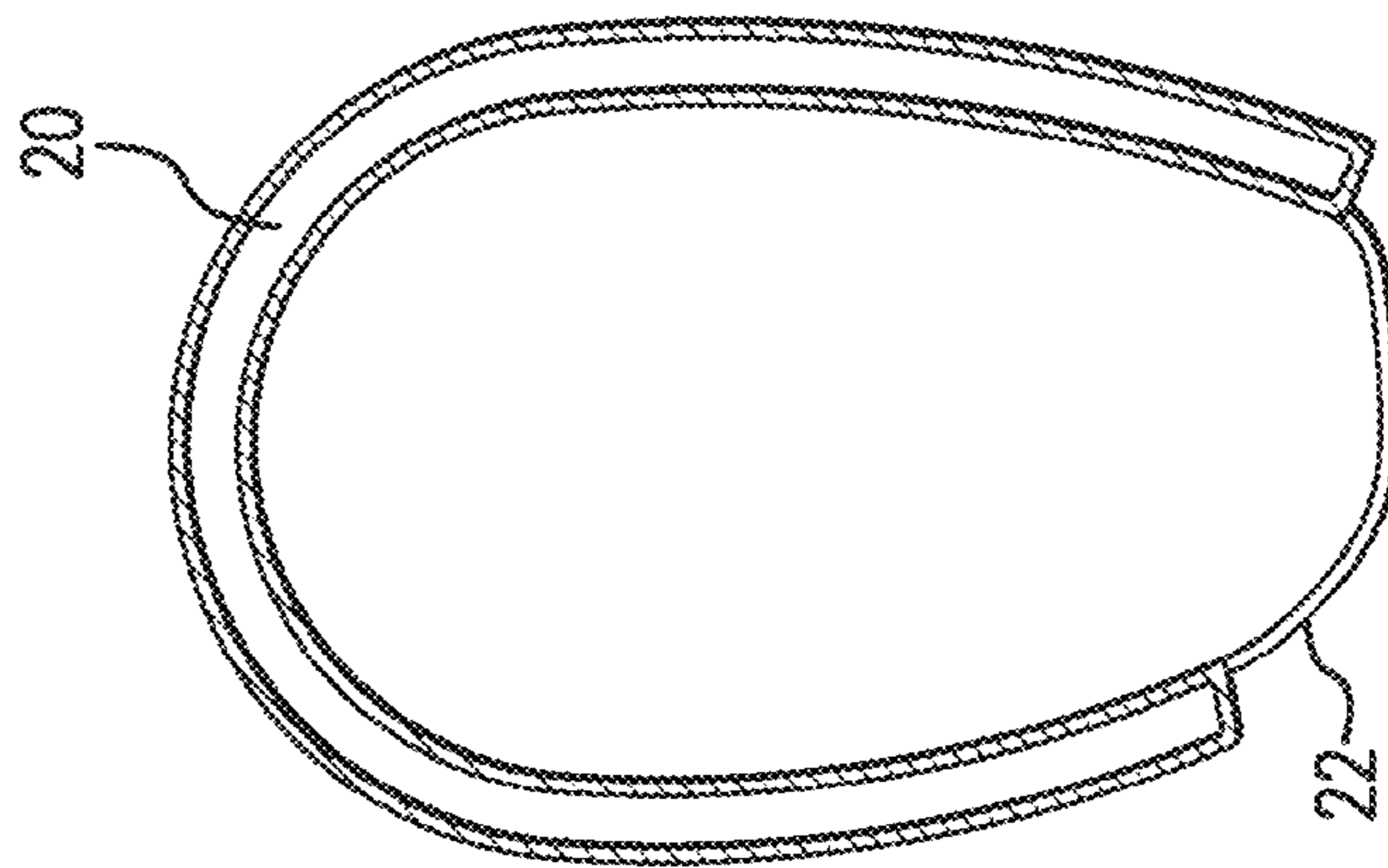


FIG. 2

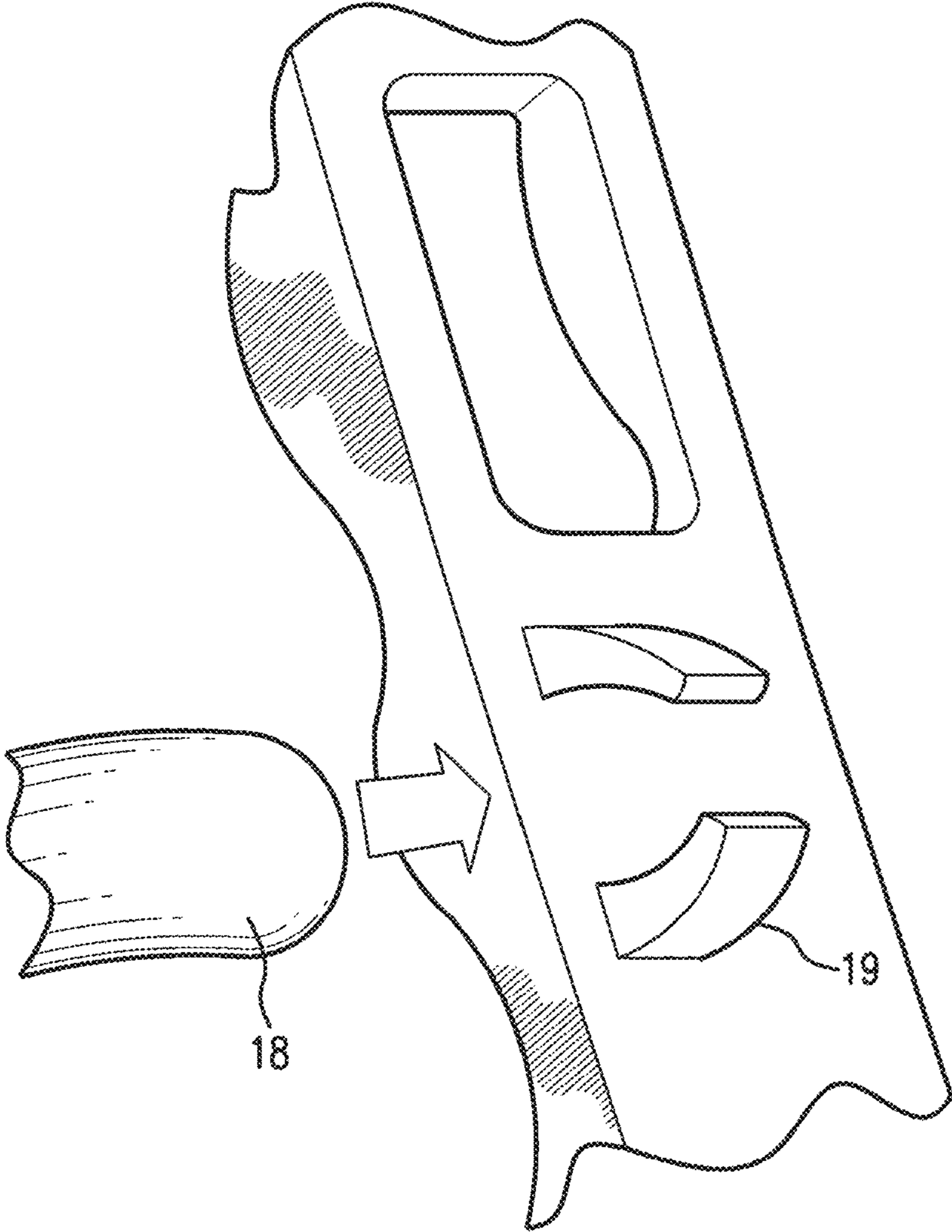


FIG.4

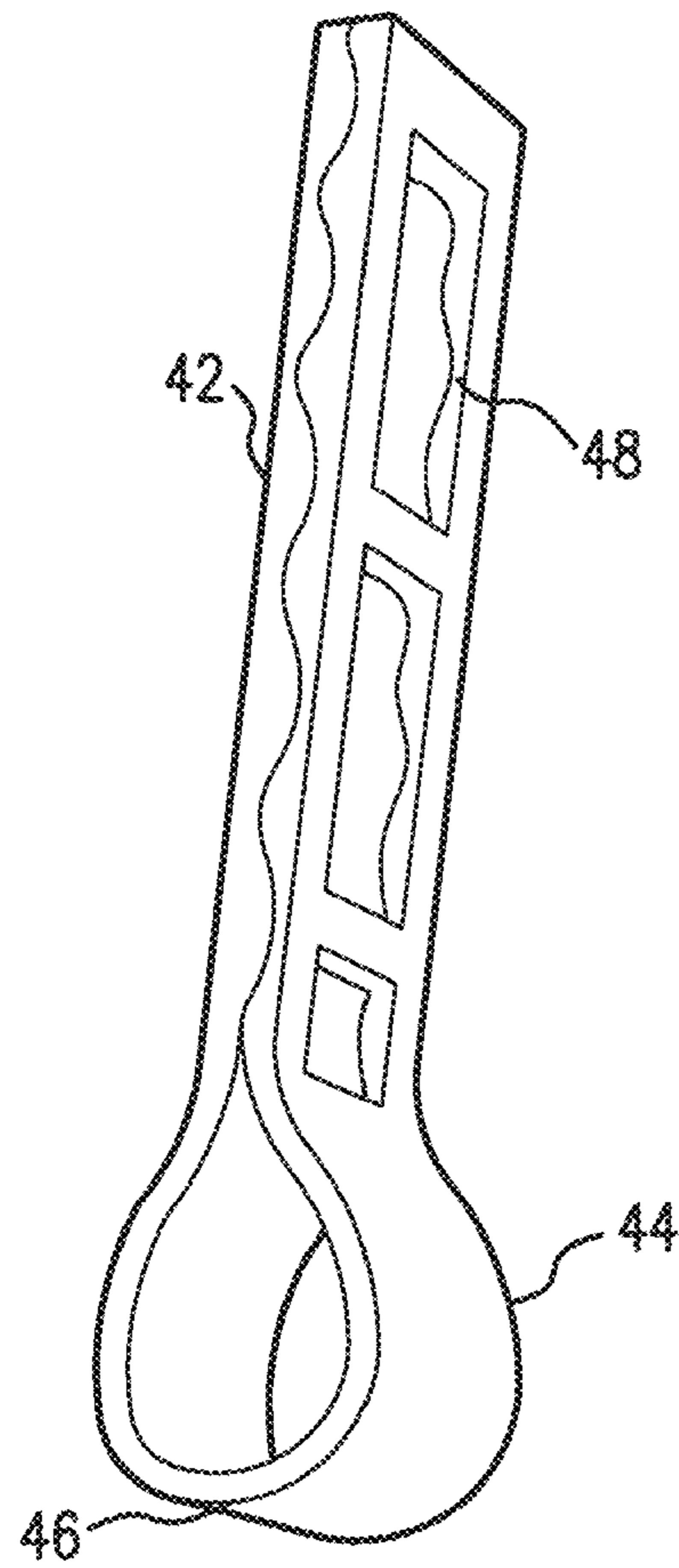


FIG. 5

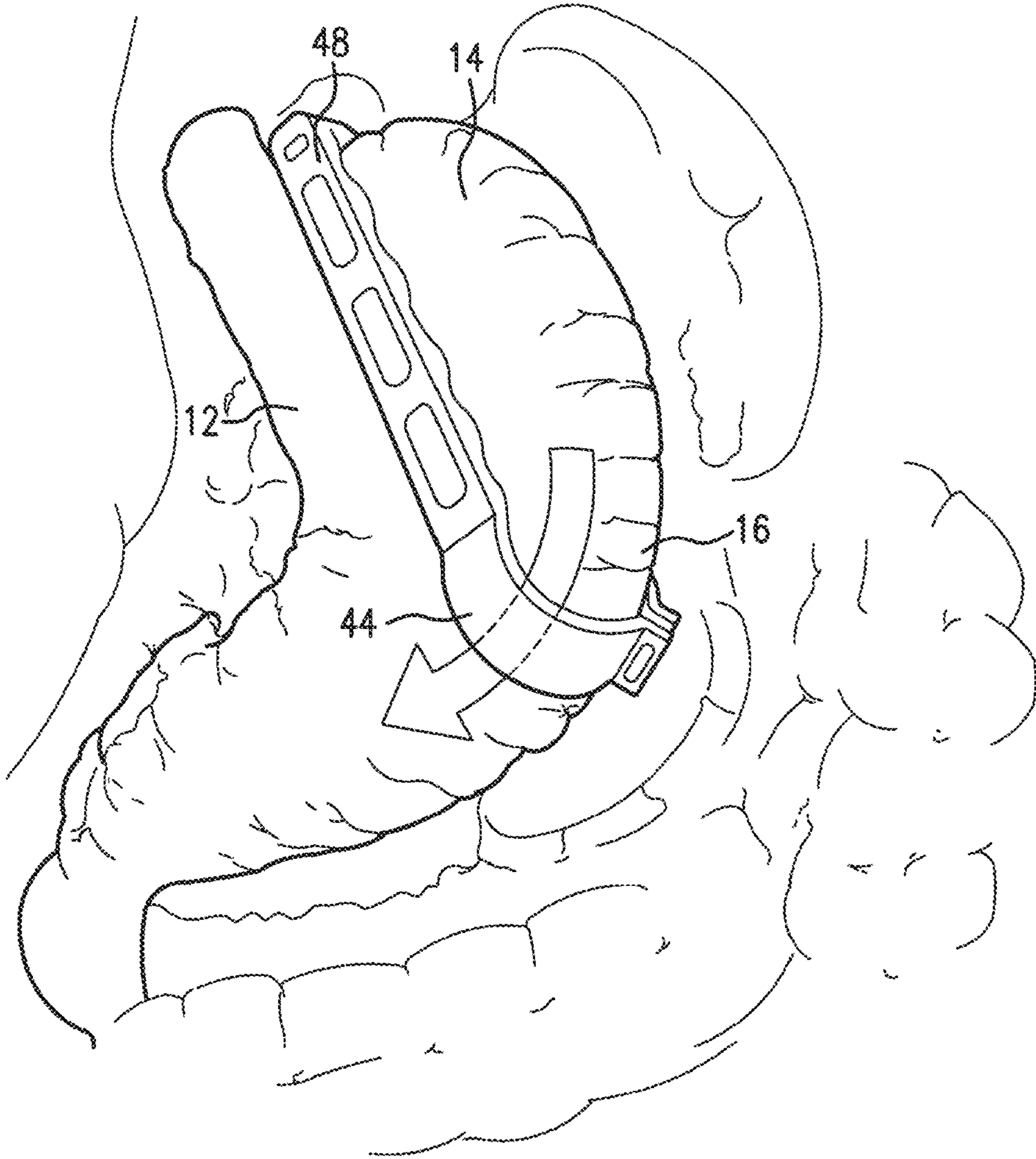


FIG. 6

VERTICALLY ORIENTED BAND FOR STOMACH

CROSS-REFERENCE TO RELATED APPLICATIONS

Pursuant to 35 U.S.C. § 120, this application is a continuation of, U.S. patent application Ser. No. 15/605,812, entitled "Vertically Oriented Band for Stomach," filed May 25, 2017, and naming Moises Jacobs and Moises Jacobs III as inventors, which is a continuation of, U.S. patent application Ser. No. 14/531,300, entitled "Vertically Oriented Band for Stomach," filed Nov. 3, 2014, and naming Moises Jacobs and Moises Jacobs III as inventors, which is a continuation of, U.S. patent application Ser. No. 11/984,452, entitled "Vertically Oriented Band for Stomach," filed Nov. 19, 2007, and naming Moises Jacobs and Moises Jacobs III as inventors, which is a continuation-in-part of U.S. patent application Ser. No. 11/797,537, entitled "Vertically Oriented Band for Stomach," filed May 4, 2007, and naming Moises Jacobs and Moises Jacobs III as inventors, which claims the benefit of U.S. Provisional Application No. 60/881,138, entitled "Vertically Oriented Band for Stomach," filed Jan. 19, 2007, and naming Moises Jacobs as inventor, all of which are incorporated by reference for all purposes.

BACKGROUND

For patients whose obesity presents an immediate serious health risk, surgical procedures are available to promote weight loss. Two of the most common surgical procedures are gastric bypass and gastric band. During gastric bypass, the stomach is made smaller and food bypasses part of the small intestine. The smaller size stomach causes the patient to eat less and the bypass of the small intestines leads to less calories being absorbed by the body.

In the most common type of gastric bypass surgery, roux-en-y, a small pouch is formed at the top of the stomach using staples. The smaller stomach is connected to the middle portion of the small intestines bypassing the upper portion of the small intestines.

Devices have been developed to form the smaller stomach from the patient's original stomach. One such device is disclosed in U.S. Patent Publication No. 2002/0022851 to Kalloo et al. (Kalloo). Kalloo discloses a loop 80 reducing the volume of the gastric cavity. A feeder line is pulled to reduce the diameter of the loop and collapse the walls of the stomach to define a smaller pouch.

U.S. Patent Publication No. 2006/0157067 to Saadat et al. (Saadat) discloses the use of tissue anchors to form a gastric pouch acting as a restriction to the passage of fluids and food. U.S. Pat. No. 5,345,949 to Shlain (Shlain) discloses a clip placed across the fundus of the stomach to restrict the inlet chamber or proximal pouch. Likewise, U.S. Pat. No. 6,869,438 to Chao (Chao) discloses a gastric partitioning clip creating a stomach pouch from the stomach to restrict the amount of food intake.

It is an object of the invention to provide a device for separating the stomach into two compartments but allowing communication between the compartments.

It is another object of the invention to provide a device for forming a smaller stomach pouch, the size of the pouch being tailored to the patient's individual circumstances.

It is another object of the invention to provide a procedure creating a small stomach pouch to limit intake of food

separate from the stomach but allowing gastric juices from the excluded stomach to flow into the pouch.

It is still another object of the invention to provide a system for creating a small pouch from the main stomach that is reversible.

It is still another object of the invention to alter the production of hormones, enzymes and chemicals that affect metabolism, energy levels, hunger, digestion, absorption of nutrients, weight loss, maintenance or gain that may be affected by exclusion of the gastric fundus and body of the stomach.

These and other objects of the invention will become apparent after reading the disclosure of the invention.

SUMMARY

An adjustable band or clamp or non-adjustable clamp is placed about the greater curvature of the stomach in a vertical orientation. The band or clamp completely compartmentalizes the stomach between a small vertical pouch and the fundus and body of the stomach. The fundus and body of the stomach are excluded from nutrients and are separated from a long narrow channel where the food travels. A small passage at the level of the antrum allows gastric juices to empty from the fundus and body of the stomach. The clamp may be applied during open surgery in laproscopic surgery or using a single port technique, or through any natural orifice in NOTES (Natural Orifice Transluminal Endoscopic surgery) or using a hybrid surgical technique.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a view of the band applied to a stomach;

FIG. 2 is a cross-sectional view of an inflatable clamp useable with the invention;

FIG. 3 is a view of a non-adjustable clamp used with the invention;

FIG. 4 is a detailed view of the strap attachment to the band;

FIG. 5 is a perspective view of a second embodiment of the band; and

FIG. 6 is a view of the band in FIG. 5 applied to a stomach.

DETAILED DESCRIPTION OF THE DRAWINGS

In FIG. 1, a stomach having the band 10 applied can be seen dividing the stomach into the pouch 12 and fundic and body area 14. Food traveling down the esophagus enters the pouch 12 and exits into the antrum. The band 10 applies pressure against the sides of the stomach to separate the stomach into the two compartments, but does not apply pressure to the stomach walls at the bottom part of the stomach. This creates a passage 16 allowing flow of gastric juices from the fundic and body area 14 into the antrum. Food will not enter the fundic and body of the stomach through this passage, however. At least one horizontal strap 18 may be used to secure the band in place. The straps may be adjustable and may apply pressure sufficient to impact the size and function of the pouch 12.

FIG. 2 shows an embodiment of the clamp having an inflatable chamber 20 and a connecting section 22. The clamp is placed about the stomach in a vertical orientation to separate the stomach into the two compartments and inflated. The clamp may have an asymmetrically placed chamber 20, that when inflated applies pressure on the stomach to seal the two compartments from one another

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except for the passage 16. The connecting section 22, being not inflated, does not apply pressure to the bottom portion of the stomach, allowing for the formation of the passage 16. In addition, the clamp may have an asymmetrically placed inflatable chamber that faces the lesser curvature side of the stomach, that when inflated or deflated only alters the lumen of the vertical compartment through which the nutrients pass and does not play a role in the creation of the two compartments.

FIG. 3 shows the rigid clamp embodiment having a U portion formed by two legs 32, 34 connected by a bight portion 36. When the clamp is placed on the stomach, the bight portion 36 fits over the top of the stomach with the legs 32, 34 applying enough pressure to collapse the walls of the stomach against one another to create the two compartments. The legs 32, 34 may or may not extend the full vertical extent of the stomach to allow for the creation of the passage 16. The legs are attached by a connector 38. When applied to the stomach, the legs serve to push the sides of the stomach together to form a complete seal but the connector allows for the formation of a passage between the two compartments. The clamp may be adjustable. The legs of the clamp may be made or adjusted to any length depending on the size of the stomach the legs can be made shorter or longer. The two legs may be connected by a magnetic coupler rather than a solid bight portion but may not be connected at all at the proximal end of the stomach. The apposition of the clamp legs about the stomach must be accomplished without sufficient force to cause ischemia of the gastric walls when the legs are closed.

Besides a clip, the vertical band may be formed as or with an inflatable balloon, as discussed with reference to FIG. 2. The orientation of the balloon is such that, upon inflation, the balloon bulges to the left to decrease the size of the compartment 12. The bottom portion may or may not be inflatable. The balloon may be attached to a tube exiting the body so that the balloon may be adjusted without the need for invasive surgery.

Straps 18 can be secured to the band in any number of conventional ways. One possible way in which to secure the straps to the band is depicted in FIG. 4. The band engages and is secured by clips 19 which extend outwardly from the band. This arrangement allows the straps to be tightened by being pulled through the clip and, if desired, the straps can be released for the removal of the band. These straps may also have an inflatable chamber and may be adjustable so as to also increase or decrease the lumen of the vertical compartment through which the nutrients pass.

An alternative construction of the band is seen in FIG. 5. In this embodiment, the band has a first section 42 having two parallel arms and a second section with two space members so that, when applied to a stomach, the passageway 16 is formed. The clamp itself may be curved to allow for better accommodation about the lesser curvature. The arms may be straight, curved or undulating. The surface may be smooth or serrated. The arms of the first section 42 are resiliently biased against one another and are spaced from one another in order that, when applied, the first section maintains the walls of the stomach together to separate the stomach into the first and second compartments. The pressure applied must be enough that the two compartments are formed but not so much that the walls of the stomach are damaged or compromise the blood supply. The section 44 is connected together by a section 46 acting as a hinge. This allows the arms of the first section 42 to be separated from one another in order that the band may be applied. Conversely, it is possible to have the two arms of the first section

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42 hinged to one another and the two arcuate portions forming the second section 44 not connected to one another.

The band of FIG. 5 applied to stomach is seen in FIG. 6. Seen here as the first section 42 extending along the stomach to separate the stomach into two compartments, including pouch 12 and fundic and body area 14, whereas the second section has arcuate arms forming a passage 16. At least one of the arms of the first section is provided with apertures 48. The apertures, which may be large or small, allow part of the stomach wall to enter the aperture to help prevent movement of the band once it has been applied.

There are many ways in which the clamp can be applied including Natural orifice transluminal endoscopic surgery (NOTES) and the combination of NOTES and an assistant trochar placed in to the abdominal cavity. Combinations include any combination of the conventional, laproscopic, NOTES and one port techniques. The NOTES technique includes transgastric, transvaginal, transrectal, transcolonic and combinations of these. Another possibility is the one port technique wherein one port is used for the introduction of several instruments. The one port technique encompasses a one port abdominal (including umbilical), perineal, retroperitoneal approaches and combinations of these.

To facilitate application of the band, a bougie may be utilized in any suitable manner, such as placed transorally, transgastrically or transintestinally. The bougie, having a vacuum suction apparatus, collapses the stomach wall to align and help the placement the clamp. To help with alignment and placement of the clamp, the bougie may have magnets to mate with the magnets or metallic areas when the clamp is provided with such. Also, the band may be made of bioabsorbable material to negate the need to remove it.

While the invention has been described with reference to preferred embodiments, various modifications would be apparent to one of ordinary skill in the art. The invention encompasses such variations and modifications.

What is claimed is:

1. A gastric band configured to be positioned on a stomach to partition the stomach into a first portion and a second portion, and to provide a passage between the first and second portions of the stomach, the gastric band comprising:

a partitioning section comprising a first arm with a first elongate portion, the first arm having a distal end and a proximal end and extending a majority of a length of the gastric band, and a second arm with a second elongate portion, the second arm having a distal end and a proximal end and extending a majority of the length of the gastric band, the first elongate portion of the first arm and the second elongate portion of the second arm curved to at least partially accommodate the lesser curvature of a stomach and, when the gastric band is positioned on the stomach, at least a portion of the second elongate portion is spaced apart a first distance from at least a portion of the first elongate portion; and

a passage-forming section comprising a first curved passage-forming member positioned adjacent the proximal end of the first arm of the partitioning section and substantially aligned with at least a portion of the first arm of the partitioning section, and a second curved passage-forming member positioned adjacent the proximal end of the second arm of the partitioning section and substantially aligned with at least a portion of the second arm of the partitioning section, wherein at least a portion of the first curved passage forming member and a portion of the second curved passage-forming member are spaced apart at least by a second

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distance, the second distance being greater than the first distance such that, when the gastric band is positioned on the stomach, the first curved passage-forming member and the second curved passage-forming member at least partially define a single aperture that allows gastric juices to flow through the passage between the first portion and the second portion of the stomach when the gastric band is positioned on the stomach.

2. The gastric band of claim 1, further comprising an inflatable portion comprising at least a portion of at least one of the partitioning section and the passage-forming section.

3. The gastric band of claim 1, wherein the first portion of the stomach is a food passageway portion, and the gastric band is configured to be positioned on the stomach to form the food passageway portion offset from the lesser curvature portion of the stomach.

4. The gastric band of claim 1, wherein the first passage-forming member and the second passage-forming member are formed of one-piece joining the proximal end of the first arm to the proximal end of the second arm.

5. The gastric band of claim 1, wherein the first and second arms of the partitioning section are in a parallel relation to one another.

6. The gastric band of claim 1, further comprising one or more openings in at least one of the first or second arms of the partitioning section.

7. The gastric band of claim 1, wherein the first elongate portion and the second elongate portion are a same length.

8. The gastric band of claim 1, further comprising a biasing section configured to bias at least the first and second arms of the partitioning section to form the first and second portions of the stomach.

9. The gastric band of claim 8, wherein the biasing section is further configured to bias the first and second passage-forming members to form the passage between the first and second portions of the stomach.

10. The gastric band of claim 8, wherein the passage-forming section of the gastric band is toward a proximal end of the gastric band, and

wherein the biasing section is disposed towards the proximal end of the gastric band.

11. The gastric band of claim 8, wherein the biasing section comprises at least one of a hinge, bight portion, and magnetic coupler.

12. A gastric band, comprising:

a first section having first and second arms spaced from one another a first distance when positioned on a stomach and configured to close walls of the stomach together to form a first compartment of the stomach and a second compartment of the stomach, said first section extending a majority of a length of said gastric band, wherein the first and second arms of the first section are curved to at least partially follow a lesser curvature of the stomach;

a second section disposed at an end of the gastric band opposite the first section, the second section having first and second portions, the first portion coupled with the first arm of the first section at an end of the first arm and the second portion coupled with the second arm of the first section at an end of the second arm, and the first and second portions at least partially spaced from one another a second distance greater than the first distance, the second section configured to form a passage between the first compartment of the stomach and the second compartment of the stomach, wherein the second section is curved along a majority of its length,

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wherein the first arm has at least one magnetic coupler located on an inner surface of the first arm and the second arm has at least one coupler configured to engage with the at least one magnetic coupler of the first arm to urge band into a closed position.

13. The gastric band of claim 12, wherein the passage formed by the second section provides a passage from the second compartment into an antrum of the stomach.

14. The gastric band of claim 12, further comprising a biasing section configured to bias at least the first and second arms of the first section to form the first and second compartments of the stomach.

15. The gastric band of claim 12, wherein the second section serves as a biasing section configured to bias at least the first and second arms of the first section.

16. The gastric band of claim 12, wherein the first and second arms are a same length.

17. A gastric band to partition a stomach into a first portion and a second portion, and to provide a passage between the first and second portions of the stomach, the gastric band comprising:

a partitioning section comprising a distal end of the gastric band;

a passage-forming section comprising a curved proximal end of the gastric band;

wherein the partitioning section comprises:

a first arm extending a portion of a length of the gastric band; and

a second arm extending a portion of the length of the gastric band,

wherein at least a portion of the second arm is spaced apart from at least a portion of the first arm by a first distance to partition the stomach into the first and second portions;

wherein the passage-forming section comprises:

a caudal-most curved portion extending toward the first arm and the second arm of the partitioning section,

a first passage-forming portion,

wherein the first passage-forming portion is at least partially curved,

wherein the first passage-forming portion is adjacent to the first arm of the partitioning section, and

wherein the first passage-forming portion extends substantially in a cranial direction towards the partitioning section;

a second passage-forming portion,

wherein the second passage-forming portion is at least partially curved,

wherein the second passage-forming portion is adjacent to the second arm of the partitioning section,

wherein the second passage-forming portion is adjacent to the first passage-forming portion, and

wherein the second passage-forming portion extends substantially in the cranial direction towards the partitioning section;

wherein the first passage-forming portion and the second passage forming portion are both united to the caudal-most curved portion;

wherein the first passage-forming portion and the second passage-forming portion are at least partially spaced apart at a location by a second distance, and wherein no portion of the gastric band crosses a tangent line that is tangent to the caudal-most point on the caudal-most curved portion.

18. A gastric band configured to be positioned on a stomach to partition the stomach into a first compartment

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and a second compartment, and to provide a passage between the first and second compartments of the stomach, the gastric band comprising:

a partitioning section positioned toward a first end of the gastric band and having a first arm with a first elongate portion, the first arm having a distal end and a proximal end and extending a majority of a length of the gastric band, and a second arm with a second elongate portion, the second arm having a distal end and a proximal end and extending a majority of the length of the gastric band and, when the gastric band is positioned on the stomach, the second elongate portion is spaced apart at least a first distance from the first elongate portion and the first elongate portion and the second elongate portion separate a portion of the stomach into the first compartment and the second compartment, wherein the first arm and the second arm are curved to at least partially form the first compartment of the stomach to follow a lesser curvature portion of the stomach;

a passage-forming section positioned toward a second end of the gastric band and substantially aligned in at least

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one plane with the partition-forming section of the gastric band, the passage-forming section configured to be in contact with a portion of the outer surface of the stomach, the passage-forming section having a curved member joining together the first arm and the second arm of the partitioning section, and wherein at least a portion of the passage-forming section defines at least a second distance greater than the first distance such that, when the gastric band is positioned on the stomach, the curved member of the passage-forming section at least partially defines the passage between the first compartment of the stomach and the second compartment of the stomach so that gastric juices within the stomach may flow between the first compartment of the stomach and the second compartment of the stomach.

19. The gastric band of claim **18** wherein, when the gastric band is positioned on the stomach, the passage-forming section urges the first elongated portion and the second elongated portion of the gastric band toward one another.

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